

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS**

SINGULAR COMPUTING LLC,

Plaintiff,

v.

GOOGLE LLC,

Defendant.

C.A. No. 1:19-cv-12551-FDS

Hon. F. Dennis Saylor IV

**DEFENDANT GOOGLE LLC'S MEMORANDUM IN SUPPORT OF ITS
MOTION TO EXCLUDE CERTAIN EXPERT TESTIMONY OF
SUNIL KHATRI, PH.D.**

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I. INTRODUCTION

The opinions offered by Singular’s expert Dr. Sunil Khatri reflect Singular’s ongoing effort to grasp for a viable infringement theory and to blackboard damages that are completely untethered to the patents-in-suit’s narrow remaining scope after the Patent Trial and Appeal Board (PTAB) found that much of what the asserted patents claim was not actually patentable.

As to infringement, Dr. Khatri admits that he’s unable to offer an infringement opinion based on faithfully applying the Court’s claim construction; so, he creates his own. Specifically, Dr. Khatri admits that he does not and cannot offer an infringement opinion that is consistent with the plain and ordinary meaning of “processing element,” which is an agreed phrase that the parties asked the Court to include in its claim construction *without further construction*. Instead, Dr. Khatri improperly offers an infringement opinion that is based solely on engaging in his own claim construction of the term “processing element”—an interpretation that differs from the term’s undisputed plain and ordinary meaning. The failure to apply the Court’s claim construction faithfully renders his entire infringement opinion inadmissible.

Dr. Khatri’s apportionment opinion likewise fails to apply the proper legal standard: he fails to identify the patentable improvement and thus fails to tether his apportionment analysis to it. Indeed, he affirmatively attributes technical value to the low-precision high dynamic range execution unit that the PTAB specifically found not patentable—a finding that Singular has now conceded. Furthermore, he also does not identify or apportion based on the appropriate patent-practicing unit. Even though his own analysis provides that infringement could occur entirely in a TPU v2 and TPU v3 *chip*, Dr. Khatri starts his apportionment analysis with TPU v2 and TPU v3 *boards* that include many additional unpatented features not in the chips. Dr. Khatri offers no explanation for this approach, which violates the Federal Circuit’s long-standing requirement to apportion based on the smallest saleable patent-practicing unit.

Finally, Dr. Khatri improperly includes various statements and conclusions that are outside his technical expertise and/or untethered to any technical opinion: this includes economic conclusions on commercial success and statements regarding Google’s purported state of mind.

The Court in the exercise of its role as gatekeeper should exclude all of these opinions.

II. LEGAL STANDARD

Under Federal Rule of Evidence 702, “district courts considering the admissibility of expert testimony must ‘act as gatekeepers, ensuring that an expert’s proffered testimony both rests on a reliable foundation and is relevant to the task at hand.’” *SiOnyx, LLC v. Hamamatsu Photonics K.K.*, 15-cv-13488-FDS, 2019 WL 13180450, at *1 (D. Mass. April 18, 2019) (citation omitted). “The ultimate purpose of the *Daubert* inquiry is to determine whether the testimony of the expert would be helpful to the jury in resolving a fact in issue.” *Cipollone v. Yale Indus. Prods., Inc.*, 202 F.3d 376, 380 (1st Cir. 2000).

As relevant here, two factors the Court must consider in performing its gatekeeping function are (i) “whether the testimony [will be] helpful to the trier of fact, *i.e.*, whether it rests on a reliable foundation and is relevant to the facts of the case”; and (ii) “whether the subject matter of the proposed testimony properly concerns ‘scientific, technical, or other specialized knowledge.’” *Earley Info. Sci., Inc. v. Omega Eng’g, Inc.*, 575 F. Supp. 3d 242, 244 (D. Mass. 2021) (citation omitted). Moreover, because expert testimony “can carry with it an unwarranted ‘aura of special reliability and trustworthiness’, courts must guard against letting it intrude in areas that jurors, by dint of common experience, are uniquely competent to judge without the aid of experts.” *United States v. Pires*, 642 F.3d 1, 12 (1st Cir. 2011) (citation omitted). Thus, even testimony otherwise admissible under Rule 702 “may nonetheless be excluded if it is likely to be misinterpreted or misused by the jury.” *SiOnyx*, 2019 WL 13180450 at *2.

The burden is on the proponent of the expert's testimony to show that the evidence is both reliable and relevant. *Milward v. Rust-Oleum Corp.*, 820 F.3d 469, 473 (1st Cir. 2016).

III. ARGUMENT

A. Dr. Khatri's infringement opinion should be excluded because it depends on an improper construction of "processing element" rather than the term's plain and ordinary meaning.

The parties agreed "that 'execution unit' is properly construed as a 'processing element,'" but disagreed as to the remainder of the construction of "execution unit." See Dkt. No. 354 ("CC Order") at 16. The Court's construction of "execution unit" thus included "processing element," with the term construed in full as "processing element comprising an arithmetic circuit paired with a memory circuit." See *id.* at 30. The Court concluded that the "specification teaches, through generalized examples, to a person of skill in the art that the processing element is a tangible object," *id.* at 24, but the Court did not construe processing element.

Given the lack of any construction of processing element, Dr. Khatri should have applied that phrase's plain and ordinary meaning when attempting to map it to the accused products. But Dr. Khatri admittedly did not do that. As Google's expert Dr. Martin Walker has explained, the plain and ordinary meaning of "processing element" is inconsistent with Dr. Khatri's infringement mapping for numerous reasons, including that Dr. Khatri points to [REDACTED]

[REDACTED]
[REDACTED]. Ex. 1 (Rebuttal Expert Report of Martin Walker, Ph.D.) ¶¶ 24, 214-227. Significantly, Dr. Khatri did not dispute Dr. Walker's opinions regarding the plain and ordinary meaning of processing element.¹ Nor did Dr. Khatri offer a view on the plain and ordinary meaning

¹ Indeed, at the time of Dr. Khatri's deposition on March 23, he had not reviewed Dr. Walker's rebuttal report on infringement, which was served nearly two weeks earlier on March 3. Ex. 2 (Dep. Tr. of Dr. Sunil Khatri, Vol. I (Mar. 23, 2023)) at 37:2-18, 47:11-48:7, 50:2-17, 52:11-15.

of the term. Instead, Dr. Khatri relied on the specification to ascribe a different meaning to processing element.

Dr. Khatri's failure to apply the plain and ordinary meaning of "processing element" requires exclusion. By interpreting the phrase "processing element" in a way that is different from the only plain and ordinary meaning of the term that is in the record, *i.e.*, Dr. Walker's understanding, Dr. Khatri has engaged in quintessential claim construction activity. *Cf. Phillips v. AWH Corp.*, 415 F.3d 1303, 1315-17 (Fed. Cir. 2005) (noting that intrinsic evidence is properly considered by the court at claim construction phase). Allowing Dr. Khatri to present his opinions would force the jury to choose between two competing interpretations of "processing element," even where there is no factual dispute as to operation of the accused device: Dr. Walker's explanation of the plain and ordinary meaning, and Dr. Khatri's construction purportedly based on the specification. This, however, is not a proper exercise for the jury. *See O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1361 (Fed. Cir. 2008).

- 1. Dr. Khatri offers his own construction of "processing element" purportedly based on the specification instead of applying the undisputed plain and ordinary meaning of the term.**

The only application of the plain and ordinary meaning of processing element in the record is in Dr. Walker's rebuttal report, in which he explains that a processing element as a POSA would understand it cannot encompass [REDACTED] as set forth in Dr. Khatri's infringement mapping. Ex. 1 ¶¶ 214-227. Dr. Khatri neither disputed Dr. Walker's opinion nor offered his own understanding of how a POSA would define a processing element. Indeed, when first asked about a POSA's understanding of processing element, Dr. Khatri answered with a tautology: "Q: And do you have an understanding as a person of ordinary skill in the art of what a processing element is? . . . A: [A] person of ordinary skill in the art . . . would look at this and read

it as a processing element comprising an arithmetic circuit" Ex. 2 at 171:17-172:1. In follow up, Dr. Khatri responded that any understanding would have to depend on the specification:

[A] person of ordinary skill in the art . . . would make a conclusion that . . . this processing element that's described comprises an arithmetic circuit. . . . And then . . . for further sort of edification in terms of what . . . the processing element was, they would refer to . . . the specification, which is intrinsic evidence that they would first look at, *rather than just . . . apply* their own sort of understanding . . . of what a processing element is or was.

Id. at 172:13-173:4 (emphasis added). Dr. Khatri went on to testify that because the Court had not construed processing element, a POSA would need to look at the specification to understand what the term meant:

[A] person of ordinary skill in the art, when they were reviewing the claim construction of the Court, they would see the word 'processing element.' And to understand it better, . . . they would look at . . . the contents of the patent, which would mean the figures and the specification, to inform them further about what processing element would mean.

Id. at 183:15-184:2. He went on to reiterate that his mapping of processing element was tied to the specification: "[T]he patent has numerous disclosures about it, and . . . it was pretty evident from that as to what was meant by processing element." *Id.* at 185:20-24; *see also id.* at 174:21-175:3 ("[A] person of ordinary skill in the art, you know, looking at this claim construction for execution unit, . . . if they looked at the patent, they would find ample disclosure as to what a -- you know, what a processing element would be.").

As Dr. Khatri admitted at his deposition, his report does not identify what in specification he relies on for the "pretty evident" meaning of "processing element." *Id.* at 185:15-186:21. Dr. Khatri does not say anywhere in the report that his understanding of a "processing element" corresponds with the embodiment that the Court relied on in its claim construction, namely the embodiment disclosed in Figure 4 of the patent and the related text. CC Order at 23-24.

2. Dr. Khatri's failure to apply the plain and ordinary meaning of processing element renders his testimony improper for consideration by the jury.

While the “intrinsic record at that time of the invention” can inform a claim term’s meaning, that analysis is for the Court at claim construction, not the jury at trial. *See O2 Micro*, 521 F.3d at 1360; *see also Cordis Corp. v. Bos. Sci. Corp.*, 561 F.3d 1319, 1337 (Fed. Cir. 2009) (improper for a party to argue claim construction to the fact finder “because the ‘risk of confusing the jury is high when experts opine on claim construction.’”) (citation omitted). *O2 Micro* holds that arguments related to claim construction are not properly “submitted to the jury”; rather, “the court, and not the jury, should resolve claim construction disputes.” 521 F.3d at 1362 & n.3.² By purportedly pegging his testimony to some unidentified part of the specification, rather than to the plain and ordinary meaning of processing element, Dr. Khatri’s opinion violates this rule. *See Cordis Corp.*, 561 F.3d at 1338 (affirming exclusion of testimony seeking to define meaning of claim term in part because “claim construction cannot be argued to the jury”). Indeed, district courts routinely exclude as improper expert testimony that relies on intrinsic evidence to support opinions as to the ordinary and customary meaning of a claim term. *See, e.g., Ferring Pharms. Inc. v. PAR Pharm., Inc.*, No. 1:15-cv-00173-RGA, 2016 WL 6471246, at *1 (D. Del. Oct. 28, 2016) (“Expert testimony about the plain and ordinary meaning of claim terms supported by reference to specification and prosecution history would constitute impermissible claim construction.”); *EMC Corp. v. Pure Storage, Inc.*, No. 13-1985-RGA, 2016 WL 775742, at *4 (D. Del. Feb. 25, 2016) (precluding expert testimony that specification embodiments supported experts’ views regarding plain and ordinary meaning of claim terms, in part because such

² The holding in *O2 Micro* follows from the general proposition that claim construction is a question of law for the Court’s determination. *O2 Micro*, 521 F.3d at 1360 (citing *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996)).

testimony “would amount to claim construction”); *MediaTek Inc. v. Freescale Semiconductor, Inc.*, No. 11-cv-5341-YGR, 2014 WL 971765, at *5 (N.D. Cal. Mar. 5, 2014) (excluding expert testimony as to purported plain and ordinary meaning of claim terms not identified for claim construction that were based “heavily on the prosecution history, specifications, and even provisional applications to explain and expound upon a specific meaning and/or requirements of the terms identified”); *see also CAO Lighting, Inc. v. Gen. Elec. Co.*, No. 20-681-GBW, 2023 WL 1930354, at *6 (D. Del. Jan. 30, 2023) (excluding expert testimony “grounded in the prosecution history to discern the meaning of a claim”).

This well-established rule against allowing experts to interpret claims at trial should be enforced here, because allowing Dr. Khatri’s testimony would force the jury to decide whether to accept Dr. Khatri’s special meaning of processing element rather than the plain and ordinary meaning explained by Dr. Walker. And, without his specification-based interpretation of “processing element,” Dr. Khatri has no basis for an infringement opinion: this element is a key part of both asserted claims, and Dr. Khatri made it clear that he does not have an alternative understanding of processing element, *i.e.*, one based on its plain and ordinary meaning, that would support his infringement opinion. Ex. 2 at 171:17-172:1, 172:13-173:4, 174:21-175:3. Moreover, as stated, the only evidence in the record regarding the plain and ordinary meaning, *i.e.*, Dr. Walker’s opinion, is that the plain and ordinary meaning is inconsistent with Dr. Khatri’s infringement mapping. Were the jury to hear Dr. Khatri’s opinion, it would only cause confusion: the jury is not allowed to interpret the claim, and because Dr. Khatri’s opinion is not tethered to the plain and ordinary meaning—and is different from that meaning—any infringement verdict rendered on the basis of that opinion would be unreliable.

B. Dr. Khatri's apportionment analysis should be excluded because he (i) did not know or apply the relevant legal standard, and (ii) did not focus his analysis on the remaining scope of the patentable invention.

Dr. Khatri's report does not include any legal standard for apportionment, and he testified at deposition that he did not know of or apply any such legal standard. Dr. Khatri's failure to apply any legal standard for apportionment is apparent in his analysis: he does not even identify the patentable invention, much less attempt to ascribe value to it.

1. Dr. Khatri's apportionment opinion fails to identify, much less apportion value to, the patentable invention.

Dr. Khatri offers an ultimate conclusion apportioning 40% of the technical value of the accused TPU systems to the asserted claims. Ex. 3 ¶ 332 (Expert Report of Sunil P. Khatri, PhD). But Dr. Khatri's analysis is not tied in any way to the applicable legal standard for apportionment. An apportionment analysis must consider "only the value of the infringing features of an accused product" where elements of multi-component products are accused of infringement. *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1226 (Fed. Cir. 2014); see also *MLC Intell. Prop., LLC v. Micron Tech., Inc.*, 10 F.4th 1358, 1373 (Fed. Cir. 2021) ("We have repeatedly held that when the accused technology does not make up the whole of the accused product, apportionment is required."). Thus, "[w]hen the accused infringing products have both patented and unpatented features, measuring this value requires a determination of the value added by such features." *Ericsson, Inc.*, 773 F.3d at 1226. In practice, this analysis "generally require[s] that royalties be based not on the entire product, but instead on the 'smallest salable patent-practicing unit [SSPPU]'." *LaserDynamics, Inc. v. Quanta Comput., Inc.*, 694 F.3d 51, 67 (Fed. Cir. 2012) (citation omitted).

Dr. Khatri does not apply the above-described standard, or any legal standard, in reaching his apportionment conclusion. His opening report includes a "Legal Principles" section that does

not discuss apportionment. *See* Ex. 3 at 7. Dr. Khatri confirmed this at his deposition: “You know, again, I don’t know the standard for apportionment, and I haven’t received anything about that standard.” *See* Ex. 2 at 290:24-291:2. Without the legal standard, Dr. Khatri’s analysis cannot be “the product of reliable principles and methods in accordance with *Daubert* and Rule 702.” *Earley Info.*, 575 F. Supp. 3d at 249. Because courts in their gatekeeping function must “ensure that only theories comporting with settled principles of apportionment [are] allowed to reach the jury,” this opinion must be excluded. *VirnetX, Inc. v. Cisco Sys., Inc.*, 767 F.3d 1308, 1328 (Fed. Cir. 2014).

Unsurprisingly, Dr. Khatri’s apportionment analysis impermissibly considers as part of the claimed invention features the PTAB deemed unpatentable. While Dr. Khatri claims to be identifying “what percentage of the added value” relative to the “closest non-infringing alternatives” is “specifically attributable to the claimed invention” (Ex. 3 ¶ 284), he never identifies the patentable invention that remains after the IPR proceedings. Thus, he necessarily could not have apportioned value to it. Indeed, as explained below, he repeatedly bases his analysis on the purported technical value attributable to the “LPHDR execution unit” rather than what could be considered patentable post-IPR, namely the limitation that the number of LPHDR execution units exceed by at least 100 the number of units that can perform at least multiplication on 32-bit numbers (also referred to as the “exceeds claims”). Furthermore, Dr. Khatri impermissibly performs a system-to-system (system-level) comparison of the accused TPU systems to other products then on the market, without isolating the patentable feature of the asserted claims—which exists entirely at the chip level—and assigning value to that feature.

a. Dr. Khatri admittedly failed to separate unpatentable features of the claimed invention from the only novel, patentable feature that remains in the asserted claims.

In *Omega Patents, LLC v. CalAmp Corp.*, the Federal Circuit held that “even if” an accused device has “the same components as those set forth in the asserted claims,” the patent owner “still must ‘adequately and reliably apportion[] between the improved and conventional features of the accused [product]’” when using the accused device as the royalty base. 13 F.4th 1361, 1377 (Fed. Cir. 2021) (quoting *Exmark Mfg. Co. v. Briggs & Stratton Power Prods. Grp., LLC*, 879 F.3d 1332, 1348 (Fed. Cir. 2018)). Thus, where, as in the instant case, the accused device indisputably included “conventional components that are not the inventive aspects of the [asserted] patent[s],” the Federal Circuit affirmed exclusion of a damages opinion that “failed to show the incremental value that its patented improvement added to the [accused device] as apportioned from the value of any conventional features.” *Id.* at 1377-78.³ The same flaw renders Dr. Khatri’s apportionment analysis inadmissible.

As a threshold matter, Dr. Khatri admitted that he was unaware of the IPR results that found certain independent claims unpatentable as obvious and certain elements in the asserted claims to have been known in the art. *See Ex. 4* (Dep. Tr. of Dr. Sunil Khatri, Vol. II (Mar. 24, 2023)) at 555:20-23, 612:17-19. Dr. Khatri necessarily cannot have apportioned value to the asserted patents’ inventive features, because he does not even know what they are. Given that Dr. Khatri served as Singular’s expert in the IPR proceedings, his lack of knowledge regarding the IPR’s

³ In *Omega Patents*, the Federal Circuit also found the “entire market value” rule, *i.e.*, when the “patented improvement drove demand for the entire . . . product” inapplicable on the record before it. 13 F.4th at 1376-78. Here, the entire market value rule is also inapplicable, because Singular hasn’t asserted it, and likewise, Dr. Khatri does not say he’s relying on it for his apportionment analysis.

outcome can only be attributed to an intentional desire—his own, Singular’s, or both—that Dr. Khatri not know how the outcome limits the scope of the asserted claims.

The PTAB’s June 2022 final written decisions (“FWDs”) invalidated a wide swath of claims⁴ in the patents-in-suit based on its conclusion that the core inventive feature that Singular claimed—the “low precision high dynamic range (LPHDR) execution unit”—was disclosed in the prior art and thus unpatentable pursuant to 35 U.S.C. § 103(a). *See* Dkt. Nos. 361-19 (FWD regarding ’273 Patent) at 25-26, 85; 361-21 (FWD regarding ’156 Patent) at 25, 83. While Google is appealing the PTAB’s non-obviousness finding as to those claims the PTAB did not find unpatentable, *i.e.*, those that in addition to the obvious LPHDR execution unit further recite the “exceeds” limitation, Singular is not appealing the obviousness ruling as to the claims finding the LPHDR execution unit unpatentable.⁵ Singular is thus bound by the PTAB’s ruling. *See Intell. Ventures I, LLC v. Lenovo Grp. Ltd.*, 370 F. Supp. 3d 251, 256 (D. Mass. 2019) (“A final judgment from the PTAB on the invalidity of a patent claim has an issue-preclusive effect on any pending actions involving that patent.”). As result, the only arguably inventive feature that remains in the asserted claims is the exceeds limitation; that feature alone must be considered in the apportionment analysis. The Federal Circuit has repeatedly held that apportionment must depend on what was actually invented above and beyond the prior art and cannot encompass conventional elements also encompassed within a claim. *See, e.g., Omega Patents*, 13 F.4th at 1377 (requiring apportionment between “patented improvement and the conventional components of the [accused] multicomponent product”); *Apple Inc. v. Wi-LAN Inc.*, 25 F.4th 960, 975 (Fed. Cir. 2022) (expert

⁴ Among the claims the PTAB invalidated were independent claim 1 of the ’156 patent, from which asserted claim 7 depends.

⁵ Although Singular initially appealed the PTAB’s rulings as well, it subsequently dismissed its appeals. *See Google LLC v. Singular Computing LLC*, 2022-2013, 2023 WL 128428 (Fed. Cir. Jan. 9, 2023).

opinion should not have been presented to the jury where testimony conflated the patented feature with what inventors admittedly did not invent).

Because Dr. Khatri does not isolate that patentable feature from unpatentable features following the FWDs, his apportionment analysis improperly relies on a conventional component of the claimed invention. Indeed, to the extent it even arguably considers the scope of the patentable invention, Dr. Khatri’s apportionment analysis credits the asserted claims with a broader invention—the LPHDR execution unit—that the PTAB expressly found unpatentable as obvious in light of the prior art. *See, e.g.*, Ex. 3 ¶¶ 292 (“Because the TPUv2 and TPUv3 devices use the claimed LPHDR execution units and their alternatives do not, they are able to include many more multipliers per unit area.”); 302 (identifying “infringing features of the accused TPUv2 and TPUv3 devices” as including “the LPHDR execution units”); 305 (“[A]s I explain above: the use of LPHDR execution units to increase performance and utilize power and circuitry more efficiently is precisely the invention at issue here.”); 308 (discussing “improvement attributable to LPHDR execution units”); 313 (“[A] majority of the peak performance improvement of the TPUv3 compared to the [TPUv2] (2.7x) would be attributed to the invention (and, in particular, to the LPHDR execution units which are embodied in the MXUs).”). Dr. Khatri’s apportionment analysis therefore necessarily fails to isolate the *patented* improvement as required by *Omega*, because he does not even identify—or know—what that feature is in relation to the unpatentable, conventional features. Accordingly, his analysis must be excluded. *See, e.g.*, *Omega Patents*, 13 F.4th at 1377; *Apple Inc.*, 25 F.4th at 975; *Pelican Int’l, Inc. v. Hobie Cat Co.*, No. 3:20-cv-02390-RSH-MSB, 2023 WL 2130379, at *24-25 (S.D. Cal. Feb. 10, 2023) (all finding expert opinion not admissible where it failed to distinguish the patentable and unpatentable features, including features that were conventional).

b. Dr. Khatri's system-to-system comparison is a flawed approach to isolating the value of the only patentable feature of the asserted claims.

Dr. Khatri's entire apportionment analysis focuses on comparing features of the accused products to features of other systems then on the market. Ex. 3 ¶ 284. In particular, he compares the accused TPU systems to certain graphics processing units, or GPUs. While comparing accused products to available market alternatives can form part of a reasonable royalty damages analysis, *see Summit 6, LLC v. Samsung Elecs. Co.*, 802 F.3d 1283 (Fed. Cir. 2015), such a comparison cannot take the place of apportioning the value that the *patentable* improvement contributes to an accused product with many unpatented features. Dr. Khatri bases his analysis largely on what he describes [REDACTED] performed between GPUs and the accused TPU systems. *See* Ex. 3 ¶¶ 304-312; Ex. 2 at 282:24-285:10 (Dr. Khatri explaining that he analyzed the internal Google comparison document cited at the top of p. 53 of his report), 291:11-293:15 (explaining that the cited document [REDACTED]). While Dr. Khatri purports to analyze those comparisons for features that are [REDACTED], he never does the fundamental work required by Federal Circuit precedent including *Ericsson* and *LaserDynamics*: starting with the patentable improvement and identifying what benefits the patentable improvement provides to the accused TPU chips. *See* Ex. 2 at 293:17-299:7 (testifying to reliance on Google documentation when asked directly whether he apportioned the value of the patented invention); *see also Ericsson, Inc.*, 773 F.3d at 1226; *LaserDynamics, Inc.*, 694 F.3d at 67.

Just one example of the problems that arise from Dr. Khatri's failure to start with the patentable improvement is his improper use of a system-level, rather than a chip-level, comparison. *See* Ex. 2 at 328:1-331:2 (discussing use of system-level comparison). Singular identifies the accused products as TPU boards that each contain four TPU chips, but Singular cannot dispute

that the only purportedly inventive feature of the asserted claims—*i.e.*, the exceeds limitation—is, under Dr. Khatri’s infringement theory, practiced entirely within a single chip. This is because Dr. Khatri’s infringement analysis concludes that each chip has at least [REDACTED] and only [REDACTED] [REDACTED]. See, e.g., Ex. 3 ¶¶ 226-228 (at least [REDACTED] per chip)), 234 ([REDACTED], 237 (asserting that source code for chip in accused TPUv2 device shows that [REDACTED] [REDACTED] “[REDACTED”]), 238 (asserting that source code for chip in accused TPUv3 device shows that “[REDACTED] [REDACTED]”). While this analysis is fundamentally flawed for at least the reasons explained in Google’s concurrently filed Motion for Summary Judgment, if it is accepted, then infringement would occur in a single chip. Nonetheless, Dr. Khatri uses pre-existing system-level comparisons without any reference to the patented features as the basis for his analysis, rather than starting with the patented improvement. See Ex. 2 at 328:1-331:2. Courts have previously excluded expert opinions based on the very same flaw of using system rather than chip-level comparisons. *See Microchip Tech. Inc. v. Aptiv Servs. US LLC*, No. 1:17-cv-01194-JDW, 2020 WL 5203600, at *5-6 (D. Del. Sept. 1, 2020) (excluding damages expert’s reasonable royalty analysis because the “patented invention” extended only to the chip—*i.e.*, “the smallest patent-practicing unit”—but the expert focused on the value of the device containing that chip). That is, by conducting his apportionment analysis at the system level, which is definitely not the smallest saleable patent-practicing unit,⁶ Dr. Khatri introduces rather

⁶ Even the TPU v2 and v3 chips include many unpatented and unpatentable features, raising a question of whether a unit even smaller than the chip may be the SSPPU. [REDACTED] But the Court need not

than mitigates the risk of awarding damages for non-patented features. *Id.* at *6 (“The more non-patented features at play, the higher the risk. Narrowing the focus to the smallest patent-practicing unit mitigates that risk.”). This one example demonstrates the larger problem of how Dr. Khatri’s failure to apply any legal standard for apportionment infects his entire analysis.

In sum, the Court should exclude Dr. Khatri’s apportionment opinions because they are not “the product of reliable principles and methods.” *See Fed. R. Evid. 702(c).*

C. Dr. Khatri’s opinion as to the “commercial success” of the accused TPUs is inadmissible for multiple reasons.

A patentee asserting commercial success as an indicator of nonobviousness must demonstrate a “legally and factually sufficient connection,” or “nexus” between “the commercial success and the patented invention.” *Rambus Inc. v. Hynix Semiconductor Inc.*, 254 F.R.D. 597, 602 (N.D. Cal. 2008) (citing *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1393 (Fed. Cir. 1988)). Dr. Khatri opines that Google has used Dr. Bates’s technology in the accused TPUs “to power all of its major products and services,” and that Google’s “commercial success is directly tied to the claimed invention.” Ex. 5 ¶¶ 253, 254 (Rebuttal Expert Report of Sunil P. Khatri, PhD). Dr. Khatri further opines that “the success of these products in the marketplace is due in large part to their use of the claimed invention, which allows them to achieve increased performance and parallelism.” *Id.* ¶ 254. Dr. Khatri’s opinion regarding commercial success should be excluded.

reach that question here, because the system-level analysis that Dr. Khatri performs is certainly not the SSPPU under his own infringement theory. Furthermore, even at the system level, Dr. Khatri’s opinion does not refer to the system that he identifies as infringing. By his own admission, the accused device is a TPU v2 or v3 board—“a circuit board to which four chips . . . are attached.” Ex. 3 ¶¶ 91-92. Nonetheless, Dr. Khatri is using systems [REDACTED] chips as the starting point of his apportionment analysis, Ex. 2 at 328:1-331:2, without any explanation for why his analysis isn’t tied to the device he’s actually accusing of infringement, the board with four chips attached.

First, it is wholly conclusory. In support of his opinion regarding commercial success, Dr. Khatri cites his opening expert report at Parts III (discussing “Infringement”) and VI (discussing “Apportionment and Non-Infringing Alternatives”). But neither of those sections cites *evidence* regarding the “commercial success” of the accused TPUs or their status in the “marketplace.” As such, Dr. Khatri’s opinion as to the commercial success of the accused TPUs should be excluded on those grounds alone. *See Abbott Biotechnology Ltd. v. Centocor Ortho Biotech, Inc.*, 09-cv-40089-FDS, 2014 WL 7330777, *5 (D. Mass. Dec. 19, 2014) (“A court may choose to exclude an expert’s opinion when it is ‘based on conjecture or speculation from an insufficient evidentiary foundation,’ or when it is ‘connected to existing data only by the *ipse dixit* of the expert.’”) (citations omitted); *see also In re Cree, Inc.*, 818 F.3d 694, 703 (Fed. Cir. 2016) (agreeing that conclusory expert declaration opining as to nexus between commercial success and patented invention is insufficient to establish nexus).

Second, Dr. Khatri necessarily cannot opine as to the required “nexus” between “the commercial success and the patented invention” if his opinion on nexus includes conventional, unpatentable features. *See Rambus Inc.*, 254 F.R.D. at 602. But, again, that is precisely what Dr. Khatri does because his opinions assume the patents’ inventive scope includes all “LPHDR execution units” instead of just the value of the “exceeds claims”—the only limitation not found in the prior art considered by the PTAB. *See supra* Part III.B, *infra* Part III.D. Thus, Dr. Khatri’s purported “nexus” opinion is inherently flawed and unreliable based on an impermissibly broad view of the “patented invention” that fails to take into account, and conflicts with, the PTAB’s findings.

Finally, Dr. Khatri lacks the expertise to opine on non-technical, economic matters regarding the accused TPUs’ commercial success. Courts routinely exclude testimony from

technical experts that opine on non-technical aspects of “commercial success” as beyond the scope of their expertise. *See, e.g., Wasica Fin. GmbH v. Schrader Int’l, Inc.*, 432 F. Supp. 3d 448, 460 (D. Del. 2020) (precluding technical expert from testifying as to commercial success based on lack of qualifications “to reliably opine on the reasons for the accused products’ sales”); *Lutron Elecs. Co. v. Inc. v. Crestron Elecs, Inc.*, 970 F. Supp. 2d 1229, 1242 (D. Utah 2013) (excluding technical experts’ testimony for lack of “requisite knowledge and experience” as to the accused products’ “commercial success”); *Rambus Inc.*, 254 F.R.D. at 604 (excluding technical expert’s opinion as to “commercial aspects” of accused products’ alleged use of claimed invention); *Radware, Ltd. v. F5 Networks, Inc.*, No. 13-cv-02024-RMW, 2016 WL 590121, at *4 (N.D. Cal. Feb. 13, 2016) (excluding expert opinion regarding non-technical issues of “commercial success and industry praise”); *Wonderland Nurserygoods Co. v. Thorley Indus. LLC*, No. 2:13-cv-00387, 2015 WL 5021416, at *13 (W.D. Pa. Aug. 21, 2015) (excluding technical expert’s opinion regarding commercial success); *XpertUniverse, Inc. v. Cisco Sys., Inc.*, No. 09-157-RGA, 2013 WL 865974, at *3 (D. Del. Mar. 7, 2013) (excluding technical expert’s opinion that defendant’s “market performance is attributable to [plaintiff’s] technology” because expert’s “ultimate conclusions on commercial success and industry acceptance[] exceeds his technical expertise”). The same result is warranted here. Dr. Khatri lacks the expertise to opine on economic matters such as commercial success and the TPUs’ marketplace position.

Accordingly, the Court should exclude Dr. Khatri’s opinions regarding commercial success, and in particular, paragraphs 253 and 254 of Dr. Khatri’s rebuttal report.

D. Dr. Khatri's opinions should be excluded where he (i) purports to opine as to Google's state of mind, and (ii) credits the patents-in-suit with a scope of invention that is beyond the asserted claims.

Dr. Khatri's report also includes specific paragraphs that should be excluded. First, he discusses Google's state of mind and the "rationale" underlying its alleged infringement. "[I]ntent or state of mind is not the proper subject of expert testimony." *OneBeacon Am. Ins. Co. v. Com. Union Assurance Co. of Can.*, 804 F. Supp. 2d 77, 85 (D. Mass. 2011), *aff'd*, 684 F.3d 237 (1st Cir. 2012). "[I]t is well settled that an expert cannot bring any scientific, technical, or specialized knowledge to bear on another person's knowledge." *U.S. ex rel. Dyer v. Raytheon Co.*, No. 08-10341-DPW, 2013 WL 5348571, at *13 (D. Mass. Sept. 23, 2013).

Nonetheless, Dr. Khatri in paragraphs 111 to 124 of his opening report opines on "the rationale underlying Google's decision to use LPHDR execution units" in the accused TPUs. *See Ex. 3 ¶ 111; see also id. ¶ 124* ("I will now set aside the issue of *why* Google built the TPU devices the way it did, . . ."). Dr. Khatri is not offering a technical opinion in these paragraphs; instead he's opining on why Google did something. *See, e.g., id. ¶¶ 115* ("Google chose to use the very same combination of low precision and high dynamic range that is recited in Dr. Bates's patent claims for *precisely the same reasons that led Dr. Bates to incorporate them into his invention* more than five years earlier.") (emphasis in original); 120 (Google's employees "didn't believe [Dr. Bates'] idea would work"); 121 ("Google's top minds started to get *excited* about his invention"); 122 ("Google designed its accused products to solve precisely the same problems that Dr. Bates's invention solved . . ."); 123 (Google's "top minds were excited," that they "saw" benefits to Dr. Bates' alleged invention, that they "took" Dr. Bates' ideas, and that they "knew" the accused products were based on Dr. Bates' ideas). As many decisions hold, experts cannot offer testimony regarding state of mind. *See, e.g., Zimmer Surgical, Inc. v. Stryker Corp.*, 365 F. Supp. 3d 466, 497 (D. Del. 2019); *OneBeacon Am. Ins. Co.*, 804 F. Supp. 2d at 85; *Deutsch v.*

Novartis Pharm. Corp., 768 F. Supp. 2d 420, 442 (E.D.N.Y. 2011); *AU New Haven, LLC v. YKK Corp.*, No. 13-CV-3411 (GHW)(SN), 2019 WL 1254763, at *13 (S.D.N.Y. Mar. 19, 2019); *Abbott Biotechnology Ltd.*, 2014 WL 7330777, at *8. Furthermore, this testimony is improper because it merely parrots Singular’s case theory without offering technical expertise. *See, e.g., Orthoflex, Inc. v. ThermoTek, Inc.*, 986 F. Supp. 2d 776, 798 (N.D. Tex. 2013); *United Servs. Auto. Ass’n v. Wells Fargo Bank, N.A.*, No. 2:18-CV-00366-JRG-RSP, 2019 WL 6896674, at *3 (E.D. Tex. Dec. 18, 2019).

Second, Dr. Khatri’s reports are replete with improper references to purported inventive features beyond the patentable scope of the claims. As noted supra Part.III.B, Dr. Khatri’s expert reports and deposition testimony credit the patents-in-suit with a scope of invention that goes beyond the asserted claims and includes unpatentable features. Specifically, the PTAB determined that the invention Dr. Khatri attributes to Dr. Bates—LPHDR execution units—was obvious. Singular is precluded from asserting arguments contrary to the PTAB’s determination on invalidity of certain claims and the unpatentability of the claimed LPHDR execution unit. *See Intell. Ventures*, 370 F. Supp. at 256; *see also Apple Inc.*, 25 F.4th at 975 (expert cannot rely on alleged infringing features that are not covered by the asserted claims). This is not a mere semantic error: Dr. Khatri was totally unaware of the PTAB’s ruling regarding obviousness and thus assumed that Dr. Bates should be credited with inventing LPHDR execution units despite that key element of the claims having been found not patentable. *See* Ex. 4 at 578:24-583:3 (testifying that Dr. Bates was the “first” to describe uses and benefits of LPHDR execution units); *see also id.* at 585:24-586:6 (“the asserted claims . . . show this completely surprising phenomena [of increased efficiency of using narrower bit widths while still achieving high precision]”). Those opinions are contrary to the PTAB finding that “[l]ow-precision arithmetic—including LPHDR

multiplication—was not novel.” Dkt. No. 361-21 at 49; *see also id.* at 43 (citing two prior art references that “teach reduced precision arithmetic and, importantly, show that high performance with reduced precision was expected for certain applications”).

Thus, every place in Dr. Khatri’s report where he improperly attributes to the asserted claims a scope of invention that includes LPHDR execution units, rather than just the claim scope that was deemed not obvious—the additional limitation of the “exceeds claims”—should be excluded. This includes, in Dr. Khatri’s opening report (Ex. 3): ¶¶ 62, 63 (improperly giving Dr. Bates credit for recognizing the inefficiencies in “then-modern conventional microprocessors” based in large part on their use of “transistor-intensive full-precision arithmetic units[,]” and for “realiz[ing] that such full-precision, inefficient components were not necessary for all applications.”); ¶¶ 64-67 (claiming that “[t]he patents-in-suit are thus directed away from prior art computers based on full-precision execution units that take up space and are wasteful of transistors[,]” and therefore improperly suggesting this was part of their novelty, and going on to quote the ’156 patent specification’s description of LPHDR execution units as also suggesting these units are part of the patents-in-suit’s novelty); ¶ 68 (improperly opining that Dr. Bates was the “first to understand” the application of LPHDR execution units and the benefits of their use.). And it includes the following paragraphs in Dr. Khatri’s rebuttal report (Ex. 5): ¶ 256 (citing Ex. 3 ¶¶ 62-68); ¶ 267 (crediting as novel “the inclusion, within computer processors, of processing elements designed to perform low precision and high dynamic range (LPHDR) arithmetic operations.”).

IV. CONCLUSION

For the foregoing reasons, the Court should exclude the improper opinions set forth in Dr. Khatri’s expert reports and preclude his testimony at trial regarding those opinions.

Respectfully submitted,

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